Washington State Department of Transportation

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Transportation GMAP Forum

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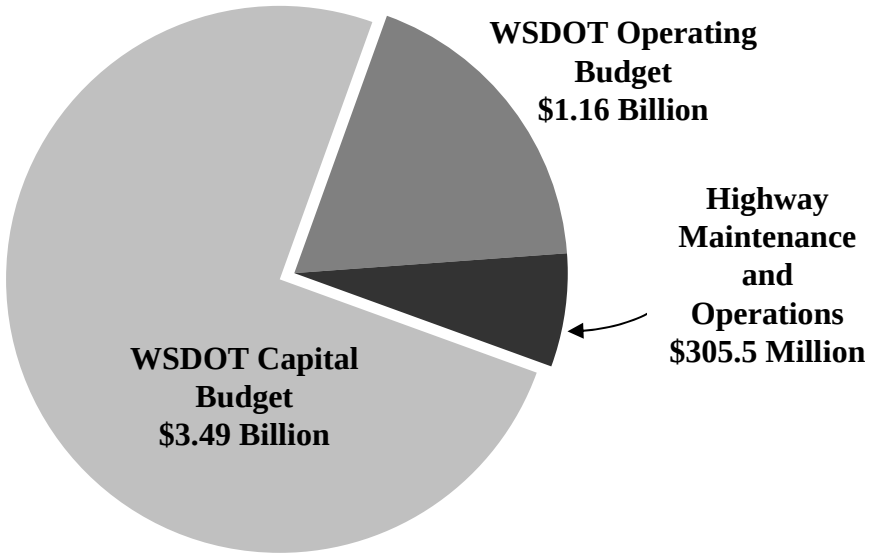
TAB 1: Highway Maintenance

Maintenance Program Background

2005-07 Enacted WSDOT Transportation Budget*



$4.65 Billion Total

- Maintenance Program's objective is to maintain highway infrastructure in good working order and keep people moving.
- Accounts for $305.5 million per biennium program, or 6.6% of total 2005-07 WSDOT budget.
- Maintenance responsibilities include:
  - Maintaining roadway and roadside of 20,000 lane miles of state highways;
  - 3,526 bridges;
  - Over 1,100 state-owned and operated traffic signal systems;
  - Winter operations responsibilities include ten major mountain passes and 42 safety rest areas.

*As amended by the 2006 Supplemental Budget

How does WSDOT Measure Performance in Highway Maintenance?

- Maintenance plays a key role in holding the highway infrastructure between construction and projects that preserve or re-construct highways.
- WSDOT has measured performance through the Maintenance Accountability Program (MAP) since 1996.
  - Nationally recognized model that has served as a model for other states.
- MAP is a management system that measures and communicates the performance outcomes of 33 highway maintenance activities. Each activity has a unique performance measure.
- Activities are prioritized by assessing their impact to meeting broad program objectives:
  - Safety of Traveling Public and Employees
  - Operate the Highway System and Keep the Road Open
  - Meet Environmental Responsibilities
  - Maintain the Infrastructure
  - Address legal mandates
  - Contribute to comfort, aesthetics, or convenience
- MAP uses field condition surveys to report Level of Service (LOS), on an annual or biannual basis, depending on the activity being measured.
- Customer surveys are used to help assure that LOS is consistent with public expectations.
- The level of resources appropriated by the Legislature is the primary driver of what the LOS target will be for the coming biennium. Periodic adjustments can be made by Maintenance Program managers.
  - Defined in terms of the condition of various highway features
- If the funded LOS delivered fails to achieve Legislative expectations, the activity is categorized as “failing” and analysis is conducted to improve the LOS.

33 Maintenance Program Activities Tracked in the Maintenance Accountability Program: CY 2005 Results

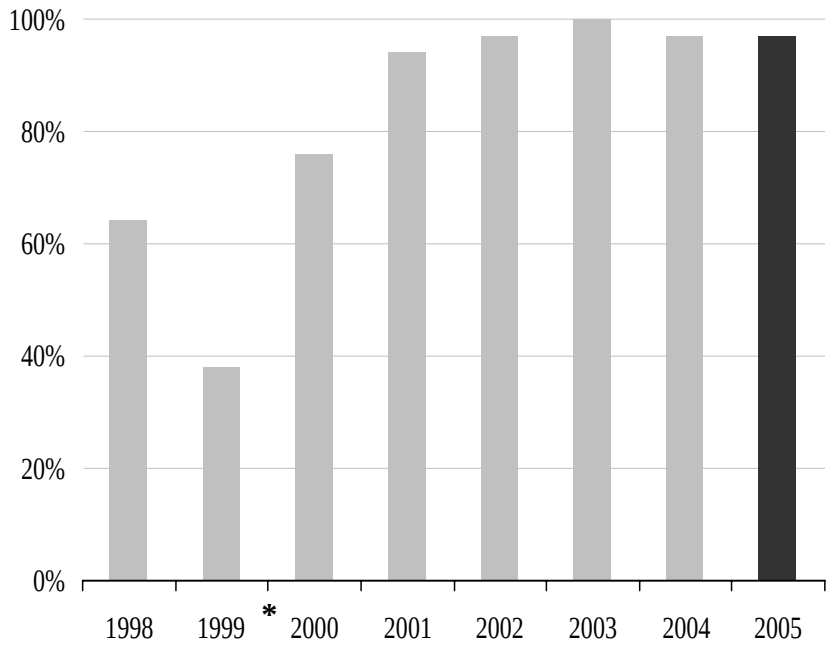
Funding choices by the Legislature determine "Funded Service Targets." Based on the funding provided to each activity, corresponding service targets are established by WSDOT. Any target that does not meet the legislatively-funded level of service is reported to have failed to meet expectations. WSDOT measures and assesses the following 33 activities, which are funded by $305.5 million in the most recent biennium:

	Funded Service Target	Pass	Fail	% of Funding
Movable & Floating Bridge Operations	B+	✓		2.3
Traffic Signal System Operations	C	✓		3.5
Snow & Ice Control Operations	***C+***	✓		***21.0***
Keller Ferry Operations	B	✓		0.4
Urban Tunnel Systems Operations	B	✓		1.2
Structural Bridge Repair	C	✓		3.1
Regulatory/Warning Sign Maintenance	C+		✓	0.9
Slope Repairs	B	✓		1.6
Intelligent Traffic Systems	B-	✓		1.7
Maintain Catch Basins & Inlets	B	✓		1.4
Pavement Patching & Repair	***B+***	✓		***8.0***
Bridge Deck Repair	B-	✓		0.5
Guardrail Maintenance	A	✓		0.5
Pavement Striping Maintenance	A-	✓		3.2
Raised/Depressed Pavement Markers	B	✓		0.7
Control of Vegetation Obstructions	B-	✓		2.6
Rest Area Operations	B	✓		3.6

	Funded Service Target	Pass	Fail	% of Funding
Sweeping and Cleaning	B+	✓		2.5
Maintain Ditches	B	✓		3.6
Highway Lighting Systems	B+	✓		3.6
Guidepost Maintenance	C-	✓		0.9
Safety Patrol	C+	✓		2.2
Maintain Culverts	C	✓		1.9
Pavement Marking Maintenance	C-	✓		0.9
Noxious Weed Control	B	✓		1.8
Shoulder Maintenance	C+	✓		1.1
Guide Sign Maintenance	B-	✓		1.4
Maintain Detention/Retention Basin	C	✓		0.2
Bridge Cleaning & Painting	C	✓		0.7
Nuisance Vegetation Control	B-	✓		3.1
Landscape Maintenance	C-	✓		1.5
Crack Sealing	C-	✓		0.4
Litter Pickup	D	✓		2.3

How Has the Maintenance Program Performed Over Time?

Percentage of legislatively funded maintenance targets achieved, 1998 - 2005



Source: WSDOT Maintenance Office

*In 1999, program funding was reduced by I-695. In addition, a severe 1998-99 winter required that funds be diverted from other activities to cover the costs of winter operations. WSDOT was also still developing the skills to gather and analyze data and manage the program using the MAP tool.

Analysis:

- In 2005, 32 of 33 (97% of activities) legislatively-funded targets were achieved

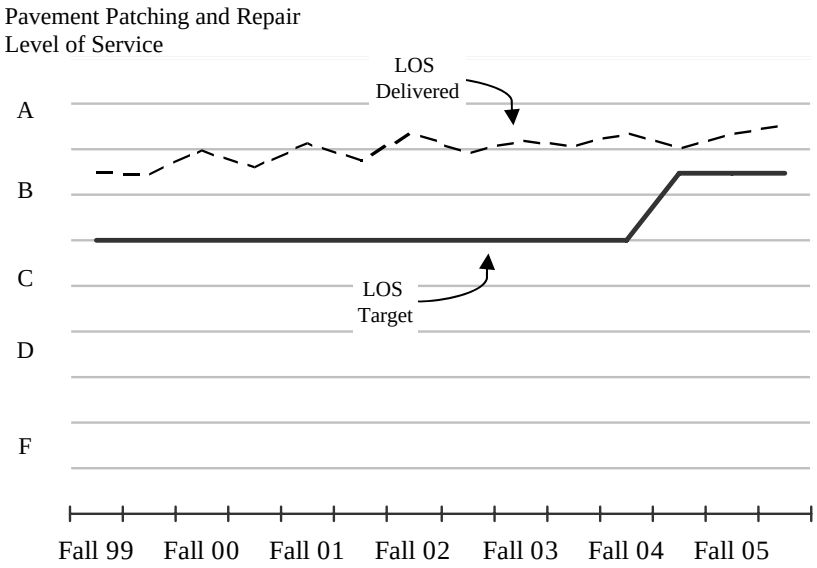
- 2005 missed target: Regulatory Signs
  - WSDOT maintains 35,000 regulatory signs
  - Prior to 2005, regions calculated LOS based on a sampling of 1% of regulatory signs
  - Assessment of missed performance found survey method was not a representative sample
  - In 2005, all regions completed an inventory of signs, and completed a much larger sample of 50% of signs

Action:

- To meet the 2006 LOS, maintenance staff will keep inventory updated and measure performance on an ongoing basis for this maintenance activity.

Information is being analyzed. 2006 evaluation will be reported in the February 2007 Gray Notebook as part of the Program's annual reporting.

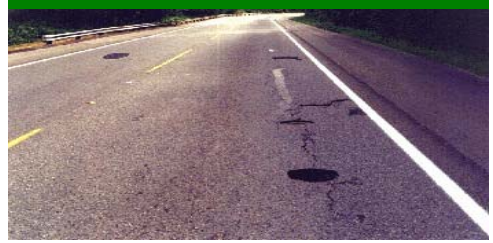
Maintenance Activity Example: Pavement Patching and Repair



Source: WSDOT Maintenance Office

Service Level A

Service Level C



Service Level F

Pavement Patching and Repair maintains the roadway pavement as closely as possible to the constructed condition. This activity occurs during the time between a highway's construction, and the time it comes up for a preservation project. Activities include:

- Mechanical Patching – Pavement repair that is completed with a machine.
- Manual Patching – Road surface repair that is completed by hand.
- Milling & Patching – Small areas of distressed pavement stretches are removed and repaired mechanically.
- Chip Seal – Application of liquid asphalt and rock chips to asphalt surface to extend life of highway.

Activity performance measure is the number of square feet of deficiencies per lane mile.* Deficiencies include potholes, alligator cracking (several cracks very close together), humps and sags, and rutting. This is measured based on a statistically valid sample for 684 one-tenth of a mile lane mile segments, and extrapolated to the entire system. Criteria are as follow:

- "A" – 0 to 1.57% of deficiencies per lane mile
- "B" – 1.58% to 3.16% of deficiencies per lane mile
- "C" – 3.17% to 7.89% of deficiencies per lane mile
- "D" – 7.9% to 15.78% of deficiencies per lane mile
- "F" – 15.78% to 100% of deficiencies per lane mile

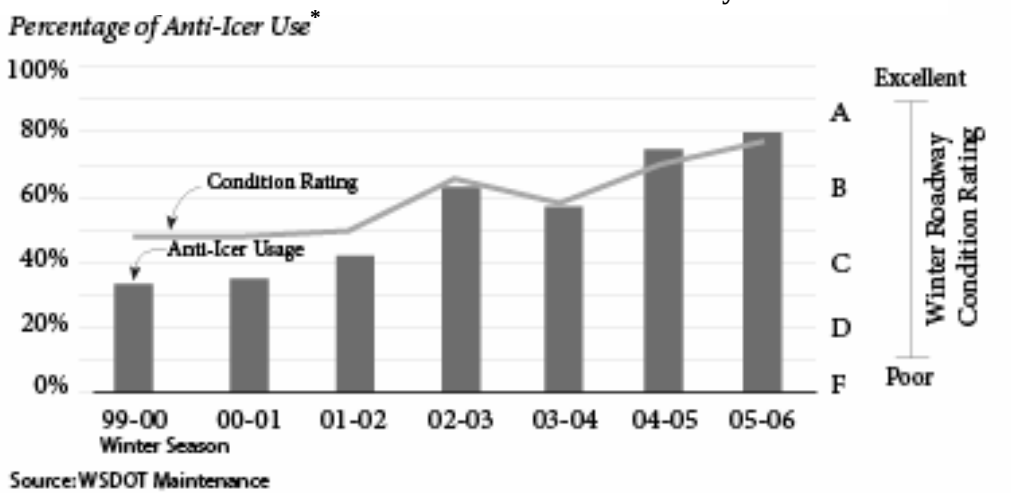
2005-07 Biennium funding is $21 million, which corresponds to a B+ LOS target. **In 2005, WSDOT delivered an A-Level of Service.**

* One lane mile=5,280 feet*12 feet (standard lane width)

For 2007-09, the cost of asphalt is up $650,000 for the Maintenance Program. These increased costs are currently funded in the WSDOT 2007-09 budget.

Maintenance Activity Example: Snow and Ice Control

Statewide Anti-Icer Use and its Effect on Winter Roadway Conditions



* Percentage of anti-icer use of all material applied to roadways for Snow and Ice Control Operations

Snow and Ice Control focuses on improving winter road conditions to increase safety, reduce road closures, and reduce the need for studded tires. Activities include:

- Application of Anti-Icers
- Application of Sand for Enhanced Traction
- Snowplowing
- Avalanche Control

One of the best strategies to keep roadways clear of snow and ice is to prevent it from accumulating and bonding to pavement. WSDOT's winter maintenance program has increased its emphasis on anti-icer use over the past several years, and has seen a corresponding increase in LOS. Anti-icer use improves safety by creating bare pavement conditions, producing a higher LOS. The alternative treatment, sand application, provides temporary traction on top of ice, and a lower LOS.

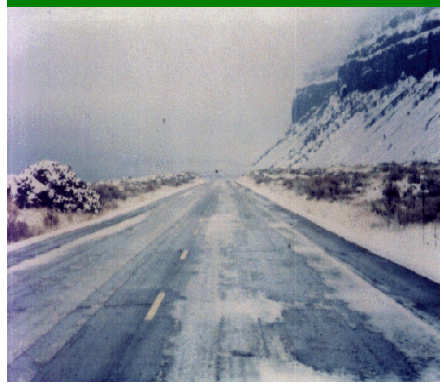
LOS is determined by assessing travel conditions at random locations throughout the state highway system during winter. Road conditions are rated and evaluated on the following criteria:

- "A" – Bare Pavement
- "B" – Bare Wheel Tracks
- "C" – Half of Roadway Bare or Sand on all of the Roadway
- "D" – Sand on Emphasis Areas (curves, hills)
- "F" – Compact Snow & Ice on Entire Roadway

2005-07 Biennium funding is $58.4 million, which corresponds to a C+ Level of Service Target. **In 2005, WSDOT delivered an A- Level of Service.** Each winter season and its severity are different, and strongly factor into WSDOT's ability to deliver a high LOS.

Service Level A

Service Level D



For 2007-09, the cost of anti-icers is up $4 million for the Maintenance Program. These increased costs **are not** currently funded in the WSDOT 2007-09 budget.